



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

JUL 17 2002

Richard Nolan, Director
Berkeley Site Office
Lawrence Berkeley National Laboratory
U.S. Department of Energy
1 Cyclotron Road, MS-90-1023
Berkeley, CA 94720

RE Lawrence Berkeley National Laboratory
EPA ID Number: CA4890008986

Dear Mr. Nolan:

Thank you for your November 26, 2001 letter transmitting the Risk Assessment of Environmental Tritium at Lawrence Berkeley National Laboratory (LBNL), dated November 19, 2001. We recognize and appreciate that this report is the result of the cooperation and sustained efforts of the U.S. Department of Energy (DOE) and the LBNL staff working with the Environmental Sampling Project Task Force, and the Tritium Issues Work Group, over the past several years in developing and implementing the Tritium Sampling and Analysis Plan (TSAP). We also appreciate your sharing with us DOE's and LBNL's interpretation of the data.

The November 19, 2001 report describes LBNL's implementation of the supplemental environmental sampling program and the sampling data for air, soil, sediment, and surface water. EPA has independently verified LBNL's data validation process and sampling and analysis system. The enclosed data tables show that the EPA split sample results agree with the LBNL air, soil, sediment, and surface water data. EPA randomly selected a subset of LBNL's data, and found that the data is reliable and meets the objectives and quality criteria specified in the TSAP. In addition, LBNL conducted vegetation sampling at the request of the community, and we understand this data will be used in LBNL's overall analysis of public health impacts. Finally, EPA has reviewed the ambient air data collected under the TSAP, and we believe that tritium air emissions from LBNL are safe. LBNL continues to meet federal Clean Air Act health standards and is therefore not a threat to public health.

EPA has, therefore, decided that there is no need for any additional Superfund involvement at this site, and we will not propose LBNL for listing on the National Priorities List. Consequently, we have changed the Superfund status of LBNL from potentially eligible to no further federal Superfund response action.

While EPA has decided that further Superfund involvement at the LBNL facility is not warranted, environmental controls and cleanup at LBNL will continue under the following programs.

The State of California will continue to oversee hazardous waste cleanup activities under State law as an authorized State implementing the Resource Conservation and Recovery Act (RCRA).

2. Under the Atomic Energy Act, DOE is overseeing the investigation of potential contamination from the underground section of the tritium stack and the area that may have been impacted by runoff from the sump to determine the need for a cleanup.
3. LBNL remains subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) program under the Clean Air Act. Although not required by the NESHAPs program, we understand that LBNL will continue to operate six of the existing ambient air sampling sites, and will publish and distribute the results from these sampling sites in the annual site environmental report.

Further, EPA recommends that DOE work with the City of Berkeley and the Alameda County Public Works Agency to implement institutional controls to limit the installation and use of domestic and irrigation wells that could be impacted by contaminated groundwater from LBNL. We also recommend that DOE and LBNL continue to meet and work with the community to keep them informed and consider their concerns.

Please forward any written comments on the enclosed decision document to:

Philip Armstrong
U.S. Environmental Protection Agency (SFD-9-1)
75 Hawthorne Street
San Francisco, CA 94105

We appreciate DOE convening the Environmental Sampling Project Task Force, and the extensive sampling conducted by LBNL to address many issues raised by the community. Thank you again for your cooperation. If you have any questions, please call Philip Armstrong at (415)972-3098 or Betsy Curnow at (415)972-3093.

Sincerely,



Jane Diamond, Acting Director
Superfund Division

Enclosures

cc: Representative Barbara Lee, w/enclosures
Gene Bernardi, CMTW, w/enclosures
Pamela Sihvola, CMTW, w/enclosures
Carl Schwab, DOE, w/enclosures
Hemant Patel, DOE, w/enclosures
David McGraw, LBNL, w/enclosures
Ron Pauer, LBNL, w/enclosures
Paul Lively, University of California, w/enclosures
Michael Bessette Rochette, RWQCB, w/enclosures
Waqar Ahmad, DTSC, w/enclosures
Mohinder Sandhu, DTSC, w/enclosures
Nabil Al-Hadithy, City of Berkeley, w/enclosures
Mayor Shirley Dean and Members of the Berkeley City Council, w/enclosures
Mayor Jerry Brown and Members of the Oakland City Council, w/enclosures

EPA ID: CA4890008986 Site Name: LAWRENCE BERKELEY LABORATORY

State ID:

Alias Site Names:

City: BERKELEY

County or Parish: ALAMEDA

State: CA

Refer to Report Dated: 07/17/2002

Report Type: FED FAC SITE INSPECTION REVIEW 001

Report Developed by: EPA/In House

DECISION:

1. Further Remedial Site Assessment under CERCLA (Superfund) is not required because:
- 1a. Site does not qualify for further remedial site assessment under CERCLA (No Further Remedial Action Planned - NFRAP)
- 1b. Site may qualify for action, but is deferred to:
2. Further Assessment Needed Under CERCLA:
- 2a. Priority: Higher Lower
- 2b. Other: (recommended action) NFRAP (No Futher Remedial Action Planned)

DISCUSSION/RATIONALE:

The U.S. Environmental Protection Agency (EPA) has determined that no further remedial action by the Federal Superfund program is warranted at the referenced site, at this time. The basis for the no further remedial action planned (NFRAP) determination is that samples have been collected in appropriate locations at the site, and the low concentrations of tritium detected in the surface water, surface soils, and ambient air do not pose a threat to public health. Although groundwater at the site is contaminated with tritium, groundwater is not used as a source of drinking water, and people are not being exposed to contaminated groundwater.

A NFRAP designation means that no additional remedial steps under the Federal Superfund program will be taken at the site unless new information warranting further Superfund consideration or conditions not previously known to EPA regarding the site are disclosed. In accordance with EPA's decision regarding the tracking of NFRAP sites, the referenced site may be removed from the CERCLIS database and placed in a separate archival database as a historical record if no further Superfund interest is warranted. Archived sites may be returned to the CERCLIS site inventory if new information necessitating further Superfund consideration is discovered.

See attached July 17, 2002 letter from Jane Diamond to Richard Nolan for further discussion/rationale.

Archive: Yes No

Site Decision Made by: PHILIP ARMSTRONG

Signature: Philip Armstrong

Date: 07/17/2002

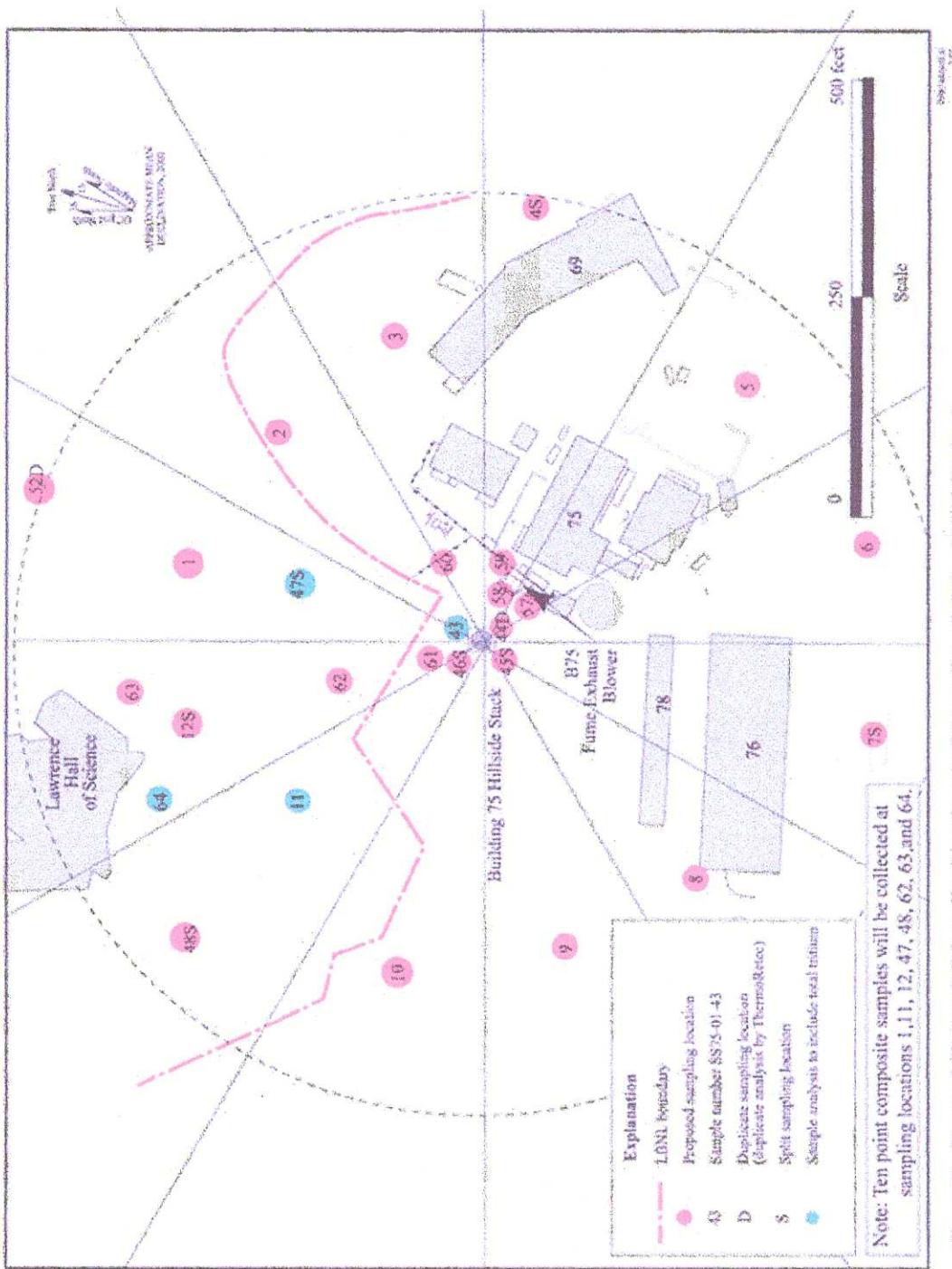
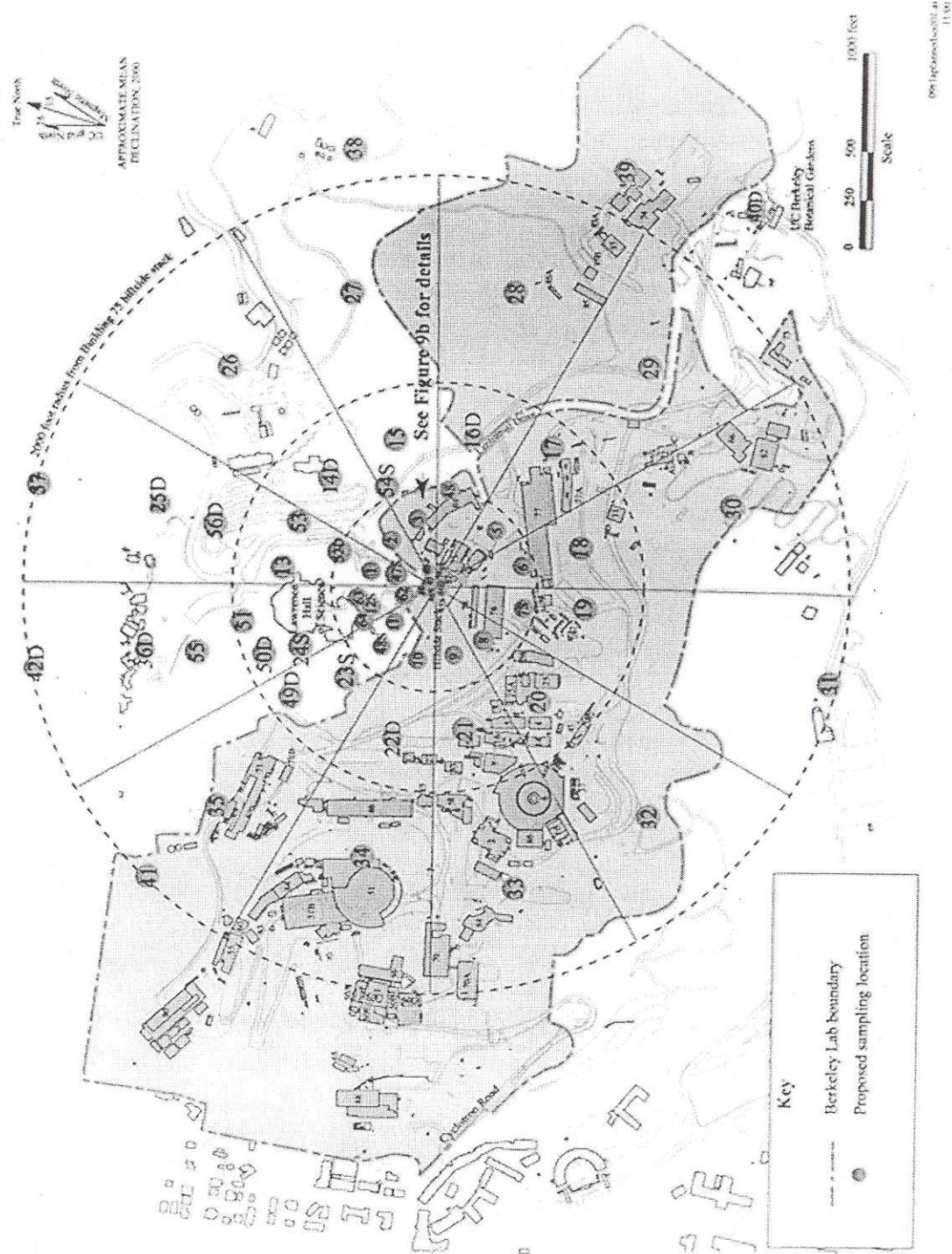
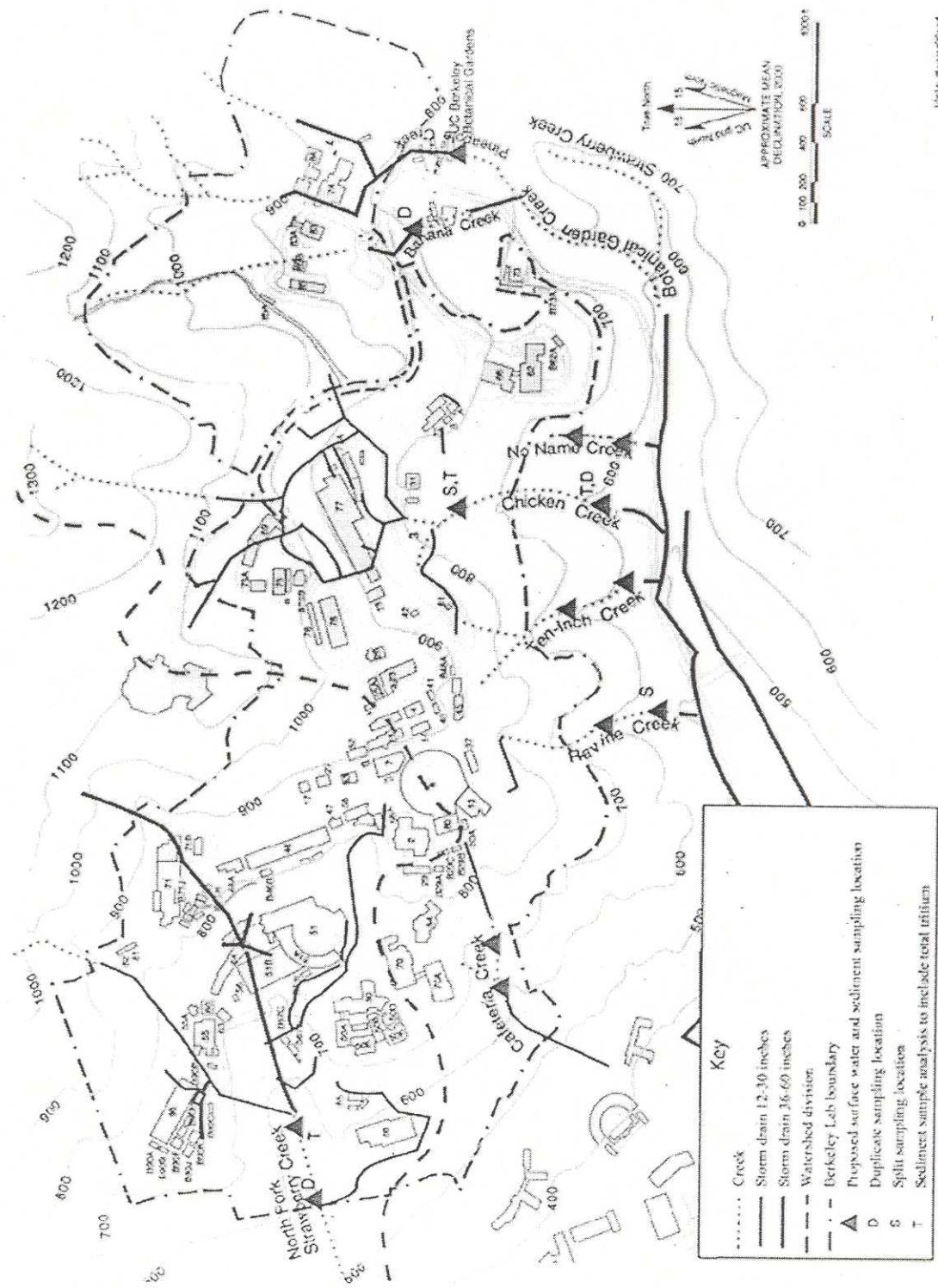


Figure 9b. Proposed Shallow Soil Sampling Locations for Tritium Near Building 75 Hillside Stack

Soil Sampling Locations



Surface Water and Sediment Sampling Locations



Ambient Air Monitoring Stations

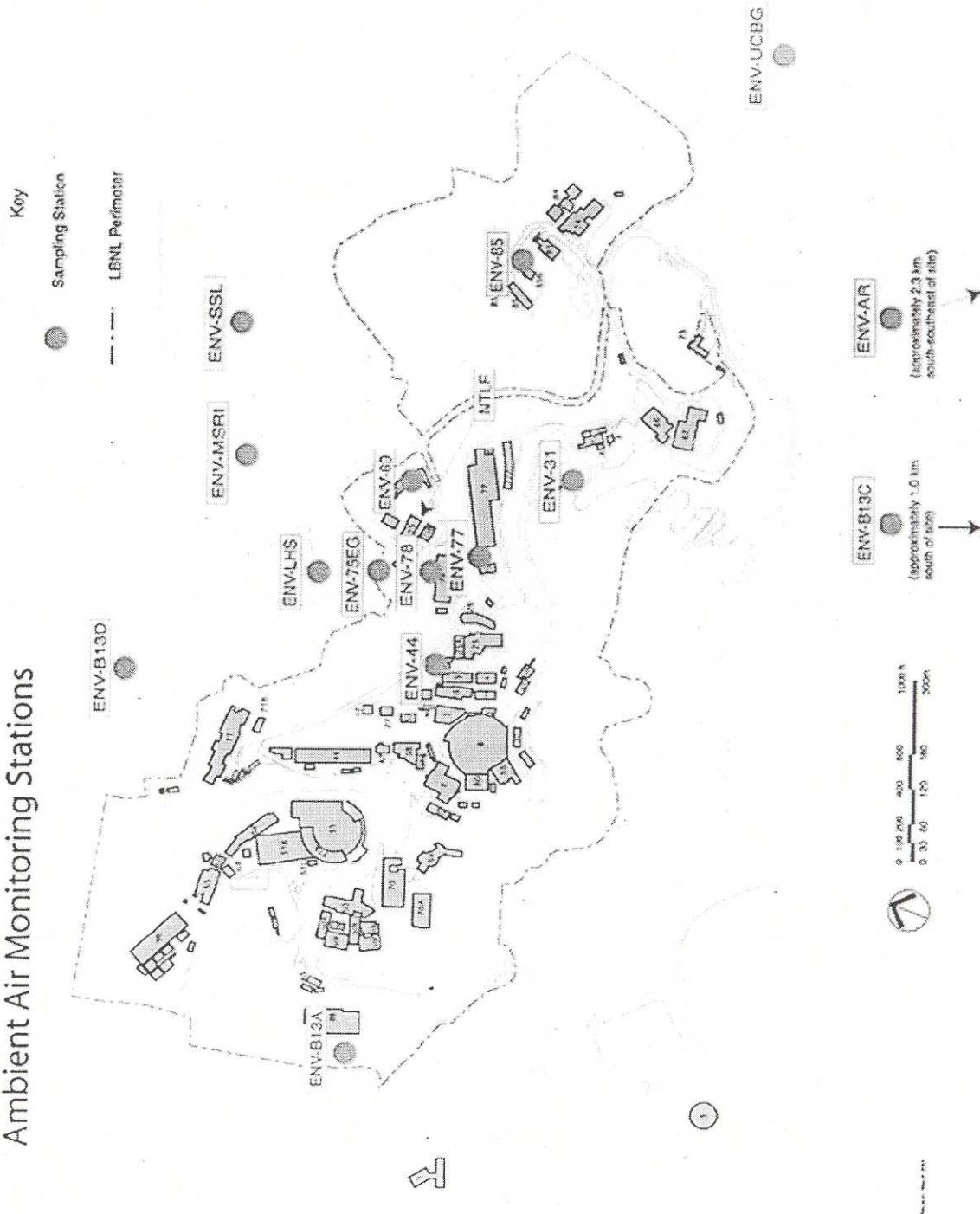


Table 1: Sediment Sample Results

Summary of LBNL Results and EPA QA Oversight Results – Final

June 16, 2002

Sample Location	Date of Sampling	Analysis	Result (pCi/g)	LBNL EPA Validated	LBNL Result Useable	EPA Result (pCi/g)	EPA Comments
Banana Creek	10-Apr-01	HTO	0.2	**	Y		
Banana Creek	31-Aug-01	HTO	U 0.2	**	Y		
Cafeteria Creek (L)	10-Apr-01	HTO	U 0.2	**	Y		
Cafeteria Creek (L)	04-Sep-01	HTO	U 0.2	**	Y		
Cafeteria Creek (U)	10-Apr-01	HTO	U 0.2	**	Y		
Cafeteria Creek (U)	04-Sep-01	HTO	U 0.2	**	Y		
Chicken Creek (L)	10-Apr-01	HTO	U 0.2	Y	Y		
Chicken Creek (L)	10-Apr-01	Total Tritium	U 5.0	**	Y		A
Chicken Creek (L)	04-Sep-01	HTO	U 0.2	**	Y		
Chicken Creek (L)	04-Sep-01	Total tritium	U 5.0	**	Y		
Chicken Creek (U)	10-Apr-01	HTO	U 0.2	Y	Y	UJ 0.043	A, B
Chicken Creek (U)	10-Apr-01	Total Tritium	U 5.0	**	Y	UJ 0.24	B
Chicken Creek (U)	31-Aug-01	HTO	U 0.2	**	Y	J 0.019	B, C
Chicken Creek (U)	31-Aug-01	Total tritium	U 5.0	**	Y	pending	B, D
Lake Anza	09-Apr-01	HTO	U 0.2	**	Y		
Lake Anza	04-Sep-01	HTO	U 0.2	**	Y		
Lake Temescal	09-Apr-01	HTO	U 0.2	**	Y		
Lake Temescal	05-Sep-01	HTO	U 0.2	**	Y		
No Name Creek (L)	10-Apr-01	HTO	U 0.2	**	Y		
No Name Creek (L)	04-Sep-01	HTO	U 0.2	**	Y		
No Name Creek (U)	10-Apr-01	HTO	U 0.2	**	Y		
No Name Creek (U)	04-Sep-01	HTO	U 0.2	**	Y		
N. Fork Strawberry Creek (L)	10-Apr-01	HTO	U 0.2	**	Y		
N. Fork Strawberry Creek (L)	31-Aug-01	HTO	U 0.2	**	Y		
N. Fork Strawberry Creek (U)	10-Apr-01	HTO	U 0.2	Y	Y		A
N. Fork Strawberry Creek (U)	10-Apr-01	Total Tritium	U 5.0	**	Y		
N. Fork Strawberry Creek (U)	31-Aug-01	HTO	U 0.2	**	Y		
N. Fork Strawberry Creek (U)	31-Aug-01	Total tritium	U 5.0	**	Y		
Pineapple Creek	10-Apr-01	HTO	U 0.2	**	Y		
Pineapple Creek	31-Aug-01	HTO	U 0.2	**	Y		
Ravine Creek (L)	09-Apr-01	HTO	U 0.2	Y	Y	UJ 0.027	A, B
Ravine Creek (L)	31-Aug-01	HTO	U 0.2	**	Y	J 0.011	B
Ravine Creek (U)	09-Apr-01	HTO	U 0.2	**	Y		
Ravine Creek (U)	31-Aug-01	HTO	U 0.2	**	Y		
Strawberry Creek Outfall	10-Apr-01	HTO	U 0.2	**	Y		
Strawberry Creek Outfall	04-Sep-01	HTO	U 0.2	**	Y		
Strawberry Creek UC	10-Apr-01	HTO	U 0.2	**	Y		
Strawberry Creek UC	04-Sep-01	HTO	U 0.2	**	Y		
Ten Inch Creek (L)	11-Apr-01	HTO	U 0.2	**	Y		
Ten Inch Creek (L)	04-Sep-01	HTO	U 0.2	**	Y		
Ten Inch Creek (U)	11-Apr-01	HTO	U 0.2	**	Y		
Ten Inch Creek (U)	04-Sep-01	HTO	U 0.2	**	Y		

* See attachment for footnotes and comments

Table 1: Sediment Results, Footnotes and Comments

Acronyms

EPA: United States Environmental Protection Agency.
HTO: Tritium in the form of water.
LBNL: Lawrence Berkeley National Laboratory.
pCi/g: picocuries per gram, a unit of measure for tritium in sediment.
QA: Quality Assurance.
QAPP: Quality Assurance Project Plan.

LBNL: Result

U: Not detected at the corresponding concentration. For example, "U 0.2" means that no tritium was detected at a concentration of at or above 0.2 picocuries of tritium per gram of sediment.

EPA Validated

Y: Yes. EPA chose the corresponding LBNL sample result and supporting analytical information for independent validation.

**: No. EPA did not chose the corresponding sample for validation. EPA chose only about 10% of the original samples for independent validation. Had EPA found differences or problems in the way LBNL validated their own data through this independent validation, EPA would have increase the number of samples independently validated.

LBNL Result Useable

Y: Yes. The corresponding LBNL result is considered useable for HRS. All of the QAPP requirements concerning data quality have been met.

EPA: Result

J: Estimated. The corresponding result is estimated, e.g. "J 0.019" means that the result is estimated as 0.019 picocuries of tritium per gram of sediment. Environmental data is often estimated at ultra trace levels.

UJ: Estimated not detected. The corresponding result is estimated not detected, e.g. "UJ 0.043" means that the result is estimated as not detected at 0.043 picocuries of tritium per gram of sediment.

Table 1: Sediment Results, Footnotes and Comments

EPA Comments

- A: Corresponding LBNL result was chosen by EPA for independent validation, which included review of LBNL's laboratory raw data and comparison of results against LBNL's own self-validation of the same result. No significant differences were found between EPA's and LBNL's validation conclusion for the corresponding LBNL result.
- B: LBNL split the corresponding sample for independent analysis by EPA. The EPA split sample result was in agreement with the LBNL result.
- C: The corresponding EPA split sample result is still in the process of being validated. The result is reported as EPA has high confidence in the quality of the result.
- D. The corresponding EPA split sample result is still in the process of being validated. The results is not reported as EPA is performing recalculation of the exact result. While the result may change by a minor amount, qualitatively the result agrees with the LBNL result to a high level of certainty.

Table 2: Soil Results

Summary of LBNL Results and EPA QA Oversight Results – Final

June 16, 2002

Sample Location	Location Comments	Date of Sampling	Analysis	Result (pCi/g)	LBNL EPA Validated	LBNL Result Useable	EPA Result (pCi/g)	EPA Comments
SSNTLF-01-01	0.5 - 1.0 ft Composite	04/04/2001	HTO	0.5	..	Y		
SSNTLF-01-01	1.5 - 2.0 ft Composite	04/04/2001	HTO	0.4	..	Y		
SSNTLF-01-01	0.5 - 1.0 ft Single Point	04/04/2001	HTO	0.3	..	Y		
SSNTLF-01-01	1.5 - 2.0 ft Single Point	04/04/2001	HTO	0.4	..	Y		
SSNTLF-01-02	0.5 - 1.0 ft Single Point	04/18/2001	HTO	0.2	..	Y		
SSNTLF-01-02	1.5 - 2.0 ft Single Point	04/18/2001	HTO	U 0.2	..	Y		
SSNTLF-01-03	0.5 - 1.0 ft Single Point	04/16/2001	HTO	U 0.2	..	Y		
SSNTLF-01-03	1.5 - 2.0 ft Single Point	04/16/2001	HTO	U 0.2	..	Y		
SSNTLF-01-04	0.5 - 1.0 ft Single Point	04/13/2001	HTO	0.3	Y	Y	J 0.22	A, B
SSNTLF-01-04	1.5 - 2.0 ft Single Point	04/13/2001	HTO	U 0.2	Y	Y	UJ 0.14	A, B
SSNTLF-01-05	0.5 - 1.0 ft Single Point	04/12/2001	HTO	U 0.2	..	Y		
SSNTLF-01-05	1.5 - 2.0 ft Single Point	04/12/2001	HTO	U 0.2	..	Y		
SSNTLF-01-06	0.5 - 1.0 ft Single Point	04/18/2001	HTO	U 0.2	..	Y		
SSNTLF-01-06	1.5 - 2.0 ft Single Point	04/18/2001	HTO	U 0.2	..	Y		
SSNTLF-01-07	0.5 - 1.0 ft Single Point	04/13/2001	HTO	U 0.2	Y	Y	UJ 0.10	A, B
SSNTLF-01-07	1.5 - 2.0 ft Single Point	04/13/2001	HTO	U 0.2	Y	Y	UJ 0.07	A, B
SSNTLF-01-08	0.5 - 1.0 ft Single Point	04/18/2001	HTO	U 0.2	..	Y		
SSNTLF-01-08	1.5 - 2.0 ft Single Point	04/18/2001	HTO	U 0.2	..	Y		
SSNTLF-01-09	0.5 - 1.0 ft Single Point	04/12/2001	HTO	U 0.2	..	Y		
SSNTLF-01-09	1.5 - 2.0 ft Single Point	04/12/2001	HTO	U 0.2	..	Y		
SSNTLF-01-10	0.5 - 1.0 ft Single Point	04/12/2001	HTO	0.2	..	Y		
SSNTLF-01-10	1.5 - 2.0 ft Single Point	04/12/2001	HTO	U 0.2	..	Y		
SSNTLF-01-11	0.5 - 1.0 ft Composite	04/04/2001	Total Tritium	U 5.0	..	Y		
SSNTLF-01-11	0.5 - 1.0 ft Composite	04/04/2001	HTO	0.5	..	Y		
SSNTLF-01-11	1.5 - 2.0 ft Composite	04/04/2001	Total Tritium	U 5.0	..	Y		
SSNTLF-01-11	1.5 - 2.0 ft Composite	04/04/2001	HTO	0.4	..	Y		
SSNTLF-01-11	0.5 - 1.0 ft Single Point	04/04/2001	HTO	0.4	..	Y		
SSNTLF-01-11	0.5 - 1.0 ft Single Point	04/04/2001	Total Tritium	U 5.0	..	Y		
SSNTLF-01-11	1.5 - 2.0 ft Single Point	04/04/2001	HTO	0.3	..	Y		
SSNTLF-01-11	1.5 - 2.0 ft Single Point	04/04/2001	Total Tritium	U 5.0	..	Y		
SSNTLF-01-12	0.5 - 1.0 ft Composite	04/13/2001	HTO	1.0	Y	Y	J 0.44	A, B
SSNTLF-01-12	1.5 - 2.0 ft Composite	04/13/2001	HTO	0.8	Y	Y	J 0.62	A, B
SSNTLF-01-12	0.5 - 1.0 ft Single Point	04/13/2001	HTO	0.9	..	Y	J 0.68	B
SSNTLF-01-12	1.5 - 2.0 ft Single Point	04/13/2001	HTO	0.7	..	Y	J 0.39	B
SSNTLF-01-13	0.5 - 1.0 ft Single Point	04/18/2001	HTO	U 0.2	..	Y		
SSNTLF-01-13	1.5 - 2.0 ft Single Point	04/18/2001	HTO	U 0.2	..	Y		
SSNTLF-01-14	0.5 - 1.0 ft Single Point	04/24/2001	Total Tritium	U 5.0	..	Y		
SSNTLF-01-14	0.5 - 1.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-14	1.5 - 2.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-14	1.5 - 2.0 ft Single Point	04/24/2001	Total Tritium	U 5.0	..	Y		
SSNTLF-01-15	0.5 - 1.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-15	1.5 - 2.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-16	0.5 - 1.0 ft Single Point	05/01/2001	HTO	U 0.2	..	Y		
SSNTLF-01-16	1.5 - 2.0 ft Single Point	05/01/2001	HTO	U 0.2	..	Y		
SSNTLF-01-17	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	Y	Y		
SSNTLF-01-17	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	Y	Y		
SSNTLF-01-18	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	Y	Y		
SSNTLF-01-18	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	Y	Y		
SSNTLF-01-19	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		

A A A A

Table 2: Soil Results

Summary of LBNL Results and EPA QA Oversight Results – Final

June 16, 2002

Sample Location	Location Comments	Date of Sampling	Analysis	Result (pCi/g)	LBNL EPA Validated	LBNL Result Useable	EPA Result (pCi/g)	EPA Comments
SSNTLF-01-19	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-20	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-20	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-21	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	Y	Y		A
SSNTLF-01-21	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	Y	Y		A
SSNTLF-01-22	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-22	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-23	0.5 - 1.0 ft Single Point	04/16/2001	HTO	U 0.2	Y	Y	UJ 0.05	A
SSNTLF-01-23	1.5 - 2.0 ft Single Point	04/16/2001	HTO	U 0.2	Y	Y	UJ 0.06	A
SSNTLF-01-24	0.5 - 1.0 ft Single Point	04/16/2001	HTO	U 0.2	..	Y	UJ 0.02	B
SSNTLF-01-24	1.5 - 2.0 ft Single Point	04/16/2001	HTO	U 0.2	..	Y	UJ 0.05	B
SSNTLF-01-25	0.5 - 1.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-25	1.5 - 2.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-26	0.5 - 1.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-26	1.5 - 2.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-27	0.5 - 1.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-27	1.5 - 2.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-28	0.5 - 1.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-28	1.5 - 2.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-29	0.5 - 1.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-29	1.5 - 2.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-30	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-30	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-31	0.5 - 1.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-31	1.5 - 2.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-32	0.5 - 1.0 ft Single Point	04/27/2001	HTO	U 0.2	..	Y		
SSNTLF-01-32	1.5 - 2.0 ft Single Point	04/27/2001	HTO	U 0.2	..	Y		
SSNTLF-01-33	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-33	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-34	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-34	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-35	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-35	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-36	0.5 - 1.0 ft Single Point	05/01/2001	HTO	U 0.2	..	Y		
SSNTLF-01-36	1.5 - 2.0 ft Single Point	05/01/2001	HTO	U 0.2	..	Y		
SSNTLF-01-37	0.5 - 1.0 ft Single Point	05/01/2001	HTO	U 0.2	..	Y		
SSNTLF-01-37	1.5 - 2.0 ft Single Point	05/01/2001	HTO	U 0.2	..	Y		
SSNTLF-01-38	0.5 - 1.0 ft Single Point	04/27/2001	HTO	U 0.2	..	Y		
SSNTLF-01-38	1.5 - 2.0 ft Single Point	04/27/2001	HTO	U 0.2	..	Y		
SSNTLF-01-39	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-39	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-40	0.5 - 1.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-40	1.5 - 2.0 ft Single Point	04/24/2001	HTO	U 0.2	..	Y		
SSNTLF-01-41	0.5 - 1.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-41	1.5 - 2.0 ft Single Point	04/23/2001	HTO	U 0.2	..	Y		
SSNTLF-01-42	0.5 - 1.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-42	1.5 - 2.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-43	0.5 - 1.0 ft Single Point	04/18/2001	HTO	7.9	..	Y		
SSNTLF-01-43	0.5 - 1.0 ft Single Point	04/18/2001	Total Tritium	41.4	..	Y		

Table 2: Soil Results

Summary of LBNL Results and EPA QA Oversight Results – Final

June 16, 2002

Sample Location	Location Comments	Date of Sampling	Analysis	Result (pCi/g)	LBNL EPA Validated	LBNL Result Useable	EPA Result (pCi/g)	EPA Comments
SSNTLF-01-43	1.5 - 2.0 ft Single Point	04/18/2001	HTO	10.0	..	Y		
SSNTLF-01-43	1.5 - 2.0 ft Single Point	04/18/2001	Total Tritium	41.2	..	Y		
SSNTLF-01-44	0.5 - 1.0 ft Single Point	04/13/2001	HTO	0.3	..	Y		
SSNTLF-01-44	1.5 - 2.0 ft Single Point	04/13/2001	HTO	0.4	..	Y		
SSNTLF-01-45	0.5 - 1.0 ft Single Point	04/13/2001	HTO	0.2	Y	Y	J 0.25	A, B
SSNTLF-01-45	1.5 - 2.0 ft Single Point	04/13/2001	HTO	0.6	Y	Y	J 0.60	A, B
SSNTLF-01-46	0.5 - 1.0 ft Single Point	04/02/2001	HTO	4.1	Y	Y	J 4.60	A, B
SSNTLF-01-46	1.5 - 2.0 ft Single Point	04/02/2001	HTO	4.4	Y	Y	J 4.38	A, B
SSNTLF-01-47	0.5 - 1.0 ft Composite	04/02/2001	Total Tritium	U 5.0	..	Y	J 0.87	B
SSNTLF-01-47	0.5 - 1.0 ft Composite	04/02/2001	HTO	0.9	..	Y	J 0.45	B
SSNTLF-01-47	1.5 - 2.0 ft Composite	04/02/2001	HTO	0.9	..	Y	J 0.27	B
SSNTLF-01-47	1.5 - 2.0 ft Composite	04/02/2001	Total Tritium	U 5.0	..	Y	J 0.93	B
SSNTLF-01-47	0.5 - 1.0 ft Single Point	04/02/2001	HTO	0.8	..	Y	J 0.28	B
SSNTLF-01-47	0.5 - 1.0 ft Single Point	04/02/2001	Total Tritium	U 5.0	..	Y	J 0.77	B
SSNTLF-01-47	1.5 - 2.0 ft Single Point	04/02/2001	Total Tritium	U 5.0	..	Y	J 0.95	B
SSNTLF-01-47	1.5 - 2.0 ft Single Point	04/02/2001	HTO	0.8	..	Y	J 0.43	B
SSNTLF-01-48	0.5 - 1.0 ft Composite	04/02/2001	HTO	0.3	Y	Y	J 0.22	A, B
SSNTLF-01-48	1.5 - 2.0 ft Composite	04/02/2001	HTO	U 0.2	Y	Y	UJ 0.08	A, B
SSNTLF-01-48	0.5 - 1.0 ft Single Point	04/02/2001	HTO	0.2	..	Y	UJ 0.14	B
SSNTLF-01-48	1.5 - 2.0 ft Single Point	04/02/2001	HTO	U 0.2	..	Y	UJ 0.08	B
SSNTLF-01-49	0.5 - 1.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-49	1.5 - 2.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-50	0.5 - 1.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-50	1.5 - 2.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-51	0.5 - 1.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-51	1.5 - 2.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-52	0.5 - 1.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-52	1.5 - 2.0 ft Single Point	05/03/2001	HTO	U 0.2	..	Y		
SSNTLF-01-53	0.5 - 1.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-53	1.5 - 2.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-54	0.5 - 1.0 ft Single Point	04/13/2001	HTO	U 0.2	Y	Y	UJ 0.03	A, B
SSNTLF-01-54	1.5 - 2.0 ft Single Point	04/13/2001	HTO	U 0.2	Y	Y	UJ 0.03	A, B
SSNTLF-01-55	0.5 - 1.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-55	1.5 - 2.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-56	0.5 - 1.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-56	1.5 - 2.0 ft Single Point	05/04/2001	HTO	U 0.2	..	Y		
SSNTLF-01-57	0.5 - 1.0 ft Single Point	04/13/2001	HTO	0.3	..	Y		
SSNTLF-01-57	1.5 - 2.0 ft Single Point	04/13/2001	HTO	0.3	..	Y		
SSNTLF-01-58	0.5 - 1.0 ft Single Point	04/13/2001	HTO	U 0.2	..	Y		
SSNTLF-01-58	1.5 - 2.0 ft Single Point	04/13/2001	HTO	0.3	..	Y		
SSNTLF-01-59	0.5 - 1.0 ft Single Point	04/13/2001	HTO	1.1	..	Y		
SSNTLF-01-59	1.5 - 2.0 ft Single Point	04/13/2001	HTO	1.3	..	Y		
SSNTLF-01-60	0.5 - 1.0 ft Single Point	04/18/2001	HTO	0.7	..	Y		
SSNTLF-01-60	1.5 - 2.0 ft Single Point	04/18/2001	HTO	1.0	..	Y		
SSNTLF-01-61	0.5 - 1.0 ft Single Point	04/18/2001	HTO	2.8	..	Y		
SSNTLF-01-61	1.5 - 2.0 ft Single Point	04/18/2001	HTO	1.9	..	Y		
SSNTLF-01-62	0.5 - 1.0 ft Composite	04/04/2001	HTO	2.2	..	Y		
SSNTLF-01-62	1.5 - 2.0 ft Composite	04/04/2001	HTO	2.2	..	Y		
SSNTLF-01-62	0.5 - 1.0 ft Single Point	04/04/2001	HTO	1.7	..	Y		

Table 2: Soil Results

Summary of LBNL Results and EPA QA Oversight Results – Final

June 16, 2002

Sample Location	Location Comments	Date of Sampling	Analysis	Result (pCi/g)	LBNL EPA Validated	LBNL Result Useable	EPA Result (pCi/g)	EPA Comments
SSNTLF-01-62	1.5 - 2.0 ft Single Point	04/04/2001	HTO	1.7	**	Y		
SSNTLF-01-63	0.5 - 1.0 ft Composite	04/06/2001	HTO	0.5	**	Y		
SSNTLF-01-63	1.5 - 2.0 ft Composite	04/06/2001	HTO	0.6	**	Y		
SSNTLF-01-63	0.5 - 1.0 ft Single Point	04/06/2001	HTO	0.6	**	Y		
SSNTLF-01-63	1.5 - 2.0 ft Single Point	04/06/2001	HTO	0.7	**	Y		
SSNTLF-01-64	0.5 - 1.0 ft Single Point	04/06/2001	HTO	0.3	**	Y		
SSNTLF-01-64	0.5 - 1.0 ft Single Point	04/06/2001	Total Tritium	U 5.0	**	Y		
SSNTLF-01-64	1.5 - 2.0 ft Single Point	04/06/2001	HTO	0.3	**	Y		
SSNTLF-01-64	1.5 - 2.0 ft Single Point	04/06/2001	Total Tritium	U 5.0	**	Y		
SSNTLF-01-65	0.5 - 1.0 ft Single Point	04/17/2001	HTO	U 0.2	**	Y		
SSNTLF-01-65	1.5 - 2.0 ft Single Point	04/17/2001	HTO	U 0.2	**	Y		
SSNTLF-01-66	0.5 - 1.0 ft Single Point	04/17/2001	HTO	U 0.2	**	Y		
SSNTLF-01-66	1.5 - 2.0 ft Single Point	04/17/2001	HTO	U 0.2	**	Y		

* See attachment for footnotes and comments

Table 2: Soil Results, Footnotes and Comments

Abbreviations

EPA: United States Environmental Protection Agency

ft: feet

HTO: Tritium in the form of water.

LBNL: Lawrence Berkeley National Laboratory

pCi/g: picocurie per gram. This is a unit of measurement for the amount tritium in soil

QA: Quality Assurance

QAPP: Quality Assurance Project Plan

Location Comments

0.5 to 1.0 ft: This is the depth interval of the soil sample taken. For the case of 0.5 to 1.0 ft, a soil core between 0.5 ft below the surface to 1.0 ft below the surface was taken for analysis.

Composite: The sample analyzed by the laboratory consisted of several Single Point samples that were mixed together to form a single sample. This is a common sampling method to average out short range variability to obtain a more representative or average result.

Single Point: This refers to the sample being a single “grab” sample.

Analysis:

HTO: Tritium in the form of water.

Total Tritium: Tritium in both water and organic forms.

LBNL: Result

U: A “U” next to a number, e.g. “U 0.2” means that no tritium was detected at or above the corresponding numerical concentration. In this case, U 0.2 means that no tritium was detected at a concentration above or at 0.2 picocuries of tritium per gram of soil.

LBNL: EPA Validated

Y: Yes. EPA chose the corresponding LBNL result for independent validation which included review of the laboratory raw data. The EPA validation agreed with the LBNL self-validation of the same result.

****:** EPA did not chose the corresponding LBNL result for independent validation. EPA relied on a limited random independent check of sample results. Had there been significant problems or discrepancies found in the samples that EPA did independently validate, EPA would have independently validated additional samples.

LBNL: LBNL Result Useable

Y: Yes. The corresponding LBNL result is considered useable for HRS purposes as it met all of the quality criteria specified in the QAPP.

EPA Result

J: The reported result is estimated. For example, "J 0.22" means that the result of 0.22 picocuries of tritium per gram of soil is considered an estimate. Environmental data are often estimated especially at ultra trace levels.

UJ: The reported result is estimated as not detected at the corresponding concentration. For example, "UJ 0.14" means that EPA estimates that there is no detectable tritium at 0.14 picocuries per gram of soil.

EPA Comments

A: The corresponding LBNL sample result was independently validated by EPA and the results of EPA's validation agrees with the results of LBNL's self-validation of the same result.

B: LBNL provide EPA part of the original sample used by LBNL for analysis. EPA independently analyzed this "split" sample and the results of EPA split analysis agrees with LBNL's result for the same sample.

Table 3: Surface Water Sample Results

Summary of LBNL Results and EPA QA Oversight Results – Final

July 15, 2002

Sample Location	Date of Sampling	Analysis	Result (pCi/L)	LBNL EPA Validated	LBNL Result Useable	EPA Result (pCi/L)	EPA Comments
Banana Creek	10-Apr-01	HTO	U 200	**	Y		
Banana Creek	31-Aug-01	HTO	U 200	**	Y		
Cafeteria Creek (Lower)	09-Apr-01	HTO	U 200	Y	Y		A
Cafeteria Creek (Upper)	09-Apr-01	HTO	U 200	Y	Y		A
Chicken Creek (Lower)	10-Apr-01	HTO	391	Y	Y		A
Chicken Creek (Lower)	04-Sep-01	HTO	296	**	Y		
Chicken Creek (Lower)	29-Oct-01	HTO	277	**	Y		
Chicken Creek (Lower)	28-Nov-01	HTO	544	**	Y		
Chicken Creek (Lower)	18-Dec-01	HTO	429	**	Y		
Chicken Creek (Lower)	30-Jan-02	HTO	538	**	Y		
Chicken Creek (Lower)	26-Feb-02	HTO	268	**	Y		
Chicken Creek (Lower)	28-Mar-02	HTO	502	**	Y		
Chicken Creek (Lower)	29-Apr-02	HTO	U 200	**	Y		
Chicken Creek (Upper)	09-Apr-01	HTO	233	Y	Y	J 378	
Chicken Creek (Upper)	31-Aug-01	HTO	U 200	**	Y		
Chicken Creek (Upper)	29-Oct-01	HTO	U 200	**	Y	J 271	B
Chicken Creek (Upper)	28-Nov-01	HTO	260	**	Y	J 334	B
Chicken Creek (Upper)	18-Dec-01	HTO	320	**	Y		
Chicken Creek (Upper)	30-Jan-02	HTO	261	**	Y	J 354	B
Chicken Creek (Upper)	26-Feb-02	HTO	327	**	Y		
Chicken Creek (Upper)	28-Mar-02	HTO	238	**	Y	J 283	B
Chicken Creek (Upper)	29-Apr-02	HTO	U 200	**	Y		
Lake Anza	09-Apr-01	HTO	U 200	Y	Y		A
Lake Anza	04-Sep-01	HTO	U 200	**	Y		
Lake Temescal	09-Apr-01	HTO	U 200	Y	Y		A
Lake Temescal	05-Sep-01	HTO	U 200	**	Y		
N. Fork Strawberry Creek (L)	09-Apr-01	HTO	U 200	Y	Y		
N. Fork Strawberry Creek (L)	31-Aug-01	HTO	U 200	**	Y		
N. Fork Strawberry Creek (L)	29-Oct-01	HTO	U 200	**	Y		
N. Fork Strawberry Creek (L)	28-Nov-01	HTO	269	**	Y		
N. Fork Strawberry Creek (L)	18-Dec-01	HTO	U 200	**	Y		
N. Fork Strawberry Creek (L)	30-Jan-02	HTO	365	**	Y		
N. Fork Strawberry Creek (L)	26-Feb-02	HTO	201	**	Y		
N. Fork Strawberry Creek (L)	28-Mar-02	HTO	U 200	**	Y		
N. Fork Strawberry Creek (L)	29-Apr-02	HTO	U 200	**	Y		
N. Fork Strawberry Creek (U)	09-Apr-01	HTO	U 200	Y	Y		
N. Fork Strawberry Creek (U)	31-Aug-01	HTO	U 200	**	Y		
N. Fork Strawberry Creek (U)	29-Oct-01	HTO	U 200	**	Y		
N. Fork Strawberry Creek (U)	28-Nov-01	HTO	207	**	Y		
N. Fork Strawberry Creek (U)	18-Dec-01	HTO	U 200	**	Y		
N. Fork Strawberry Creek (U)	30-Jan-02	HTO	271	**	Y		
N. Fork Strawberry Creek (U)	26-Feb-02	HTO	218	**	Y		
N. Fork Strawberry Creek (U)	28-Mar-02	HTO	U 200	**	Y		
N. Fork Strawberry Creek (U)	29-Apr-02	HTO	U 200	**	Y		
No Name Creek (Lower)	10-Apr-01	HTO	U 200	**	Y		
No Name Creek (Lower)	04-Sep-01	HTO	U 200	**	Y		
No Name Creek (Upper)	10-Apr-01	HTO	U 200	**	Y		
No Name Creek (Upper)	04-Sep-01	HTO	U 200	**	Y		
Pineapple Creek	10-Apr-01	HTO	U 200	**	Y		
Pineapple Creek	31-Aug-01	HTO	U 200	**	Y		
Ravine Creek (Lower)	09-Apr-01	HTO	U 200	Y	Y	UJ 70.0	

Table 3: Surface Water Sample Results

Summary of LBNL Results and EPA QA Oversight Results – Final

July 15, 2002

Sample Location	Date of Sampling		Result (pCi/L)	LBNL EPA Validated	LBNL Result Useable	EPA Result (pCi/L)	EPA Comments
Ravine Creek (Upper)	09-Apr-01	HTO	U 200	**	Y		
Strawberry Creek Outfall	09-Apr-01	HTO	U 200	Y	Y		A
Strawberry Creek Outfall	04-Sep-01	HTO	U 200	**	Y		
Strawberry Creek Outfall	29-Oct-01	HTO	U 200	**	Y		
Strawberry Creek Outfall	28-Nov-01	HTO	U 200	**	Y		
Strawberry Creek Outfall	18-Dec-01	HTO	U 200	**	Y		
Strawberry Creek Outfall	30-Jan-02	HTO	U 200	**	Y	J 99.2	B
Strawberry Creek Outfall	27-Feb-02	HTO	U 200	**	Y		
Strawberry Creek Outfall	28-Mar-02	HTO	U 200	**	Y		
Strawberry Creek Outfall	29-Apr-02	HTO	U 200	**	Y		
Strawberry Creek UC	09-Apr-01	HTO	U 200	**	Y		
Strawberry Creek UC	04-Sep-01	HTO	U 200	**	Y		
Strawberry Creek UC	29-Oct-01	HTO	U 200	**	Y		
Strawberry Creek UC	28-Nov-01	HTO	U 200	**	Y		
Strawberry Creek UC	18-Dec-01	HTO	U 200	**	Y		
Strawberry Creek UC	30-Jan-02	HTO	U 200	**	Y		
Strawberry Creek UC	27-Feb-02	HTO	U 200	**	Y		
Strawberry Creek UC	28-Mar-02	HTO	U 200	**	Y		
Strawberry Creek UC	29-Apr-02	HTO	U 200	**	Y		
Ten Inch Creek (Lower)	11-Apr-01	HTO	U 200	Y	Y		A
Ten Inch Creek (Upper)	11-Apr-01	HTO	U 200	Y	Y		A

* See attachment for footnotes and comments

Table 3: Surface Water Results, Footnotes and Comments

Acronyms

EPA: United States Environmental Protection Agency.
HTO: Tritium in the form of water.
LBNL: Lawrence Berkeley National Laboratory.
pCi/L: picocuries per liter, a unit of measure for tritium in water.
QA: Quality Assurance.
QAPP: Quality Assurance Project Plan.

LBNL: Result

U: Not detected at the corresponding concentration. For example, "U 200" means that no tritium was detected at a concentration of at or above 200 picocuries of tritium per liter of water sample.

EPA Validated

Y: Yes. EPA chose the corresponding LBNL sample result and supporting analytical information for independent validation.

**: No. EPA did not chose the corresponding sample for validation. EPA chose only about 10% of the original samples for independent validation. Had EPA found differences or problems in the way LBNL validated their own data through this independent validation, EPA would have increase the number of samples independently validated.

LBNL Result Useable

Y: Yes. The corresponding LBNL result is considered useable for HRS. All of the QAPP requirements concerning data quality have been met.

EPA: Result

J: Estimated. The corresponding result is estimated, e.g. " J 378" means that the result is estimated as 378 picocuries of tritium per liter of water sample. Environmental data is often estimated at ultra trace levels.

UJ: Estimated not detected. The corresponding result is estimated not detected, e.g. "UJ 70.0" means that the result is estimated as not detected at 70.0 picocuries of tritium per liter of water sample.

Table 3: Surface Water Results, Footnotes and Comments

EPA Comments

A: Corresponding LBNL result was chosen by EPA for independent validation, which included review of LBNL's laboratory raw data and comparison of results against LBNL's own self-validation of the same result. No significant differences were found between EPA's and LBNL's validation conclusion for the corresponding LBNL result.

B: LBNL split the corresponding sample for independent analysis by EPA. The EPA split sample result was in agreement with the LBNL result based on an analysis of the associated analytical variability of the EPA and LBNL results. However, the set of EPA compared against the corresponding LBNL results suggested one set of data is biased. EPA sent LBNL a set of water performance evaluation samples and found that LBNL data was accurate, hence, LBNL data was not qualified based on the differences between EPA and LBNL results. Further, the magnitude of the differences between EPA and LBNL results were not large enough in the context of the HRS decision to warrant reevaluation of the LBNL results.

Table 4: Ambient Air Sample Results

Summary of LBNL Results and EPA QA Oversight Results -- Final (Revised)

July 15, 2002

Sample Location	Monthly Sampling Period End Date	Analysis	Result (pCi/m3)	LBNL		LLNL Result (pCi/m3)	EPA Result (pCi/m3)	EPA Comments
				EPA Validated	LBNL Result Useable			
ENV-31	02-May-01	HTO	8	**	Y		8.8	C
ENV-31	05-Jun-01	HTO	U 4	Y	Y			A
ENV-31	03-Jul-01	HTO	U 5	Y	Y			A, B
ENV-31	07-Aug-01	HTO	U 4	Y	Y			A
ENV-31	04-Sep-01	HTO	8.6	**	Y			
ENV-31	02-Oct-01	HTO	U 5	**	Y			
ENV-31	06-Nov-01	HTO	U 4	**	Y			
ENV-31	04-Dec-01	HTO	U 5	**	Y	2.35		B
ENV-31	08-Jan-02	HTO	U 4	**	Y	3.11		B
ENV-31	05-Feb-02	HTO	U 5	**	Y			
ENV-31	05-Mar-02	HTO	U 4.9	**	Y			
ENV-31	02-Apr-02	HTO	U 6.6	**	Y			
ENV-31	07-May-02	HTO	U 4	**	Y			
ENV-44	02-May-01	HTO	12.9	**	Y			
ENV-44	05-Jun-01	HTO	4.2	Y	Y			A
ENV-44	03-Jul-01	HTO	13.7	Y	Y			A
ENV-44	07-Aug-01	HTO	U 4	Y	Y			A
ENV-44	04-Sep-01	HTO	5.7	**	Y			
ENV-44	02-Oct-01	HTO	8.7	**	Y		11.3	C
ENV-44	06-Nov-01	HTO	7.9	**	Y			
ENV-44	04-Dec-01	HTO	U 5.6	**	Y			
ENV-44	08-Jan-02	HTO	7.7	**	Y			
ENV-44	05-Feb-02	HTO	13.4	**	Y			
ENV-44	05-Mar-02	HTO	11.1	**	Y			
ENV-44	02-Apr-02	HTO	U 5	**	Y		5.5	C
ENV-44	07-May-02	HTO	U 4	**	Y			
ENV-69	02-May-01	HTO	19.4	**	Y			
ENV-69	05-Jun-01	HTO	10.7	Y	Y	R 13.7		A, C, D
ENV-69	03-Jul-01	HTO	16.6	Y	Y			A
ENV-69	07-Aug-01	HTO	18.4	Y	Y			A
ENV-69	04-Sep-01	HTO	14.0	**	Y			
ENV-69	02-Oct-01	HTO	23.8	**	Y			
ENV-69	06-Nov-01	HTO	7.9	**	Y			
ENV-69	04-Dec-01	HTO	7.9	**	Y			
ENV-69	08-Jan-02	HTO	12.3	**	Y			
ENV-69	05-Feb-02	HTO	10	**	Y			
ENV-69	05-Mar-02	HTO	12.2	**	Y			
ENV-69	02-Apr-02	HTO	9.7	**	Y			
ENV-69	07-May-02	HTO	4.8	**	Y			
ENV-75EG	02-May-01	HTO	35.3	**	Y		43.9	C
ENV-75EG	05-Jun-01	HTO	34.9	Y	Y	R 40.9		A, C, D
ENV-75EG	03-Jul-01	HTO	90.3	Y	Y	119		A, C
ENV-75EG	07-Aug-01	HTO	41.4	Y	Y	57.3		A, C
ENV-75EG	04-Sep-01	HTO	62.0	**	Y	59		C
ENV-75EG	02-Oct-01	HTO	76.9	**	Y	77.9		C
ENV-75EG	06-Nov-01	HTO	33.8	**	Y	43.6		C

Table 4: Ambient Air Sample Results

Summary of LBNL Results and EPA QA Oversight Results – Final (Revised)

July 15, 2002

Sample Location	Monthly Sampling Period End Date	Analysis	Result (pCi/m3)	LBNL EPA Validated	LBNL Result Useable	LLNL Result (pCi/m3)	EPA Result (pCi/m3)	EPA Comments
ENV-75EG	04-Dec-01	HTO	31.6	**	Y		36.7	C
ENV-75EG	08-Jan-02	HTO	77.8	**	Y		73.8	C
ENV-75EG	05-Feb-02	HTO	36.1	**	Y		33.7	C
ENV-75EG	05-Mar-02	HTO	46.9	**	Y		40.4	C
ENV-75EG	02-Apr-02	HTO	23.7	**	Y		20.9	C
ENV-75EG	07-May-02	HTO	9.19	**	Y		9.7	C
ENV-77	02-May-01	HTO	36.3	**	Y			A
ENV-77	05-Jun-01	HTO	18.3	Y	Y			A
ENV-77	03-Jul-01	HTO	52.7	Y	Y			A
ENV-77	07-Aug-01	HTO	5.9	Y	Y			A
ENV-77	04-Sep-01	HTO	8.5	**	Y			
ENV-77	02-Oct-01	HTO	24.1	**	Y			
ENV-77	06-Nov-01	HTO	15.0	**	Y		19.3	C
ENV-77	04-Dec-01	HTO	9.6	**	Y			
ENV-77	08-Jan-02	HTO	12.5	**	Y			
ENV-77	05-Feb-02	HTO	23.4	**	Y			
ENV-77	05-Mar-02	HTO	18.3	**	Y			
ENV-77	02-Apr-02	HTO	9.1	**	Y			
ENV-77	07-May-02	HTO	U 4	**	Y		4.5	C
ENV-78	02-May-01	HTO	49.3	**	Y			
ENV-78	05-Jun-01	HTO	21.6	Y	Y			
ENV-78	03-Jul-01	HTO	59.3	Y	Y		76.7	A, C
ENV-78	07-Aug-01	HTO	11.0	Y	Y			A
ENV-78	04-Sep-01	HTO	28.2	**	Y			
ENV-78	02-Oct-01	HTO	36.0	**	Y			
ENV-78	06-Nov-01	HTO	20.4	**	Y			
ENV-78	04-Dec-01	HTO	19.8	**	Y			
ENV-78	08-Jan-02	HTO	21.8	**	Y			
ENV-78	05-Feb-02	HTO	33.3	**	Y			
ENV-78	05-Mar-02	HTO	25.2	**	Y			
ENV-78	02-Apr-02	HTO	13.8	**	Y			
ENV-78	07-May-02	HTO	7.4	**	Y			
ENV-85	02-May-01	HTO	U 5	**	Y			
ENV-85	05-Jun-01	HTO	7.3	Y	Y			A
ENV-85	03-Jul-01	HTO	U 5	Y	Y			A
ENV-85	07-Aug-01	HTO	U 4	Y	Y	2.49		A, B
ENV-85	04-Sep-01	HTO	8.3	**	Y			
ENV-85	02-Oct-01	HTO	U 5	**	Y			
ENV-85	06-Nov-01	HTO	U 4	**	Y			
ENV-85	04-Dec-01	HTO	U 5	**	Y		3.5	C
ENV-85	08-Jan-02	HTO	U 4	**	Y		U 1.6	C
ENV-85	05-Feb-02	HTO	U 5.06	**	Y	1.22		B
ENV-85	05-Mar-02	HTO	U 5	**	Y			
ENV-85	02-Apr-02	HTO	U 5.1	**	Y			
ENV-85	07-May-02	HTO	U 4	**	Y			
ENV-AR	05-Jun-01	HTO	5.3	Y	Y	6.41		A, B

Table 4: Ambient Air Sample Results

Summary of LBNL Results and EPA QA Oversight Results – Final (Revised)

July 15, 2002

Sample Location	Monthly Sampling Period End Date	Analysis	Result (pCi/m3)	LBNL EPA Validated	LBNL Result Useable	LLNL Result (pCi/m3)	EPA Result (pCi/m3)	EPA Comments
ENV-AR	03-Jul-01	HTO	U 5	Y	Y	5.46		A, B
ENV-AR	07-Aug-01	HTO	U 4	Y	Y	2.36		A, B
ENV-AR	05-Sep-01	HTO	6.7	**	Y	2.43		B
ENV-AR	02-Oct-01	HTO	U 5.2	**	Y	2.55		B
ENV-AR	06-Nov-01	HTO	U 4	**	Y	1.28		B
ENV-AR	04-Dec-01	HTO	U 4.9	**	Y	1.48		B
ENV-AR	08-Jan-02	HTO	23.8	**	Y	22.1		B
ENV-AR	05-Feb-02	HTO	U 4.98	**	Y	1.58		B
ENV-AR	05-Mar-02	HTO	15.5	**	Y	26		B
ENV-AR	02-Apr-02	HTO	U 5	**	Y	1.02		B
ENV-AR	07-May-02	HTO	6.8	**	Y	8.06		B
ENV-B13A	02-May-01	HTO	U 5	**	Y	8.42		B
ENV-B13A	05-Jun-01	HTO	6.4	Y	Y			A
ENV-B13A	03-Jul-01	HTO	U 5	Y	Y			A
ENV-B13A	07-Aug-01	HTO	U 4	Y	Y			A
ENV-B13A	04-Sep-01	HTO	U 5	**	Y			
ENV-B13A	02-Oct-01	HTO	U 5	**	Y	1.2		B
ENV-B13A	06-Nov-01	HTO	U 4	**	Y			
ENV-B13A	04-Dec-01	HTO	U 4.9	**	Y			
ENV-B13A	08-Jan-02	HTO	U 4	**	Y			
ENV-B13A	05-Feb-02	HTO	U 5	**	Y		3.3	C
ENV-B13A	05-Mar-02	HTO	U 4.9	**	Y			
ENV-B13A	02-Apr-02	HTO	U 5	**	Y	1.18		B
ENV-B13A	07-May-02	HTO	U 4	**	Y			
ENV-B13C	02-May-02	HTO	U 5	**	Y			
ENV-B13C	05-Jun-01	HTO	8.6	Y	Y	8.4		A, B
ENV-B13C	03-Jul-01	HTO	U 4.9	Y	Y			A
ENV-B13C	07-Aug-01	HTO	U 4	Y	Y			A
ENV-B13C	04-Sep-01	HTO	U 5	**	Y			
ENV-B13C	02-Oct-01	HTO	U 4	**	Y			
ENV-B13C	06-Nov-01	HTO	U 4	**	Y	0.99		B
ENV-B13C	04-Dec-01	HTO	U 4.9	**	Y			
ENV-B13C	08-Jan-02	HTO	U 4	**	Y			
ENV-B13C	05-Feb-02	HTO	U 5	**	Y			
ENV-B13C	05-Mar-02	HTO	U 4.9	**	Y			
ENV-B13C	02-Apr-02	HTO	U 5	**	Y			
ENV-B13C	07-May-02	HTO	U 4	**	Y	0.71		B
ENV-B13D	02-May-01	HTO	U 5	**	Y			
ENV-B13D	05-Jun-01	HTO	U 4.9	Y	Y			A
ENV-B13D	03-Jul-01	HTO	U 5	Y	Y			A
ENV-B13D	07-Aug-01	HTO	4.4	Y	Y			A
ENV-B13D	04-Sep-01	HTO	6.1	**	Y		6.23	C
ENV-B13D	02-Oct-01	HTO	5.9	**	Y			
ENV-B13D	06-Nov-01	HTO	U 4	**	Y			
ENV-B13D	04-Dec-01	HTO	11.4	**	Y			
ENV-B13D	08-Jan-02	HTO	U 4	**	Y			

Table 4: Ambient Air Sample Results

Summary of LBNL Results and EPA QA Oversight Results – Final (Revised)

July 15, 2002

Sample Location	Monthly Sampling Period End Date	Analysis	Result (pCi/m ³)	LBNL EPA Validated	LBNL Result Useable	LLNL Result (pCi/m ³)	EPA Result (pCi/m ³)	EPA Comments
ENV-B13D	05-Feb-02	HTO	U 5	**	Y		6.5	C
ENV-B13D	05-Mar-02	HTO	U 4.9	**	Y			
ENV-B13D	02-Apr-02	HTO	U 5	**	Y			
ENV-B13D	07-May-02	HTO	U 4	**	Y			
ENV-LHS	02-May-01	HTO	20.9	**	Y		21.5	C
ENV-LHS	05-Jun-01	HTO	12.1	Y	Y	R	15.4	A, C, D
ENV-LHS	03-Jul-01	HTO	25.7	Y	Y		34.8	A, C
ENV-LHS	07-Aug-01	HTO	34.8	Y	Y		41.3	A, C
ENV-LHS	04-Sep-01	HTO	25.3	**	Y		26.7	C
ENV-LHS	02-Oct-01	HTO	33.9	**	Y		37.1	C
ENV-LHS	06-Nov-01	HTO	14.1	**	Y		13.9	C
ENV-LHS	04-Dec-01	HTO	14.2	**	Y		21.8	C
ENV-LHS	08-Jan-02	HTO	35.2	**	Y		33.4	C
ENV-LHS	05-Feb-02	HTO	8.4	**	Y		8.4	C
ENV-LHS	05-Mar-02	HTO	11.1	**	Y		10.8	C
ENV-LHS	02-Apr-02	HTO	8.69	**	Y		7.2	C
ENV-LHS	07-May-02	HTO	5.3	**	Y		8.2	C
ENV-MSRI	05-Jun-01	HTO	16.3	Y	Y			A A A
ENV-MSRI	03-Jul-01	HTO	12.0	Y	Y			
ENV-MSRI	07-Aug-01	HTO	14.0	Y	Y			
ENV-MSRI	04-Sep-01	HTO	12.0	**	Y			
ENV-MSRI	02-Oct-01	HTO	16.8	**	Y			
ENV-MSRI	06-Nov-01	HTO	6.5	**	Y			
ENV-MSRI	04-Dec-01	HTO	U 5	**	Y			
ENV-MSRI	08-Jan-02	HTO	U 4	**	Y			
ENV-MSRI	05-Feb-02	HTO	U 5	**	Y			
ENV-MSRI	05-Mar-02	HTO	22.6	**	Y			
ENV-MSRI	02-Apr-02	HTO	U 5	**	Y			
ENV-MSRI	07-May-02	HTO	U 4	**	Y			
ENV-SSL	05-Jun-01	HTO	18.5	Y	Y			A
ENV-SSL	03-Jul-01	HTO	8.2	Y	Y			A
ENV-SSL	07-Aug-01	HTO	9.8	Y	Y	9.19	13.7	A, C
ENV-SSL	04-Sep-01	HTO	9.0	**	Y			B
ENV-SSL	02-Oct-01	HTO	9.1	**	Y			
ENV-SSL	06-Nov-01	HTO	4.3	**	Y			
ENV-SSL	04-Dec-01	HTO	U 5	**	Y			
ENV-SSL	08-Jan-02	HTO	U 4	**	Y			
ENV-SSL	05-Feb-02	HTO	U 5	**	Y			
ENV-SSL	05-Mar-02	HTO	U 5	**	Y		4.49	B
ENV-SSL	02-Apr-02	HTO	U 5	**	Y			
ENV-SSL	07-May-02	HTO	4.5	**	Y			
ENV-UCBG	02-May-01	HTO	6.2	**	Y		8.02	B
ENV-UCBG	05-Jun-01	HTO	6.2	Y	Y		7.71	A, B
ENV-UCBG	03-Jul-01	HTO	U 5	Y	Y		4.37	A, B
ENV-UCBG	07-Aug-01	HTO	U 4	Y	Y		4.2	A, B
ENV-UCBG	04-Sep-01	HTO	U 4.9	**	Y		2.63	B

Table 4: Ambient Air Sample Results

Summary of LBNL Results and EPA QA Oversight Results – Final (Revised)

July 15, 2002

Sample Location	Monthly Sampling Period End Date	Analysis	Result (pCi/m3)	LBNL		LLNL Result (pCi/m3)	EPA Result (pCi/m3)	EPA Comments
				EPA Validated	LBNL Result Useable			
ENV-UCBG	02-Oct-01	HTO	U 5	**	Y	5.22		B
ENV-UCBG	07-Nov-01	HTO	U 8.9	**	Y	2.15		B
ENV-UCBG	08-Jan-02	HTO	U 5.3	**	Y	2.44		B
ENV-UCBG	05-Feb-02	HTO	U 5	**	Y	3.11		B
ENV-UCBG	05-Mar-02	HTO	U 4.9	**	Y	1.42		B
ENV-UCBG	02-Apr-02	HTO	U 5.1	**	Y	2.23		B
ENV-UCBG	07-May-02	HTO	U 4	**	Y	1.26		B

* See attachment for footnotes and comments

Table 4: Ambient Air Results, Footnotes and Comments

Acronyms

EPA: United States Environmental Protection Agency.

HTO: Tritium in the form of water.

LBNL: Lawrence Berkeley National Laboratory.

LLNL: Lawrence Livermore National Laboratory.

pCi/m³: picocuries per cubic meter, a unit of measure for tritium in air.

QA: Quality Assurance.

QAPP: Quality Assurance Project Plan.

LBNL: Result

U: Not detected at the corresponding concentration. For example, U 4.0 means that no tritium was detected at a concentration of at or above 4.0.

EPA Validated

Y: Yes. EPA chose the corresponding LBNL sample result and supporting analytical information for independent validation.

**: No. EPA did not chose the corresponding sample for validation. EPA chose only about 10% of the original samples for independent validation. Had EPA found differences or problems in the way LBNL validated their own data through this independent validation, EPA would have increase the number of samples independently validated.

LBNL Result Useable

Y: Yes. The corresponding LBNL result is considered useable for HRS. All of the QAPP requirements concerning data quality have been met.

EPA: Result

R: Rejected. The corresponding result is rejected for general use. Rejected data may still be of value for narrowly defined use. Data is rejected when an important data characteristic such as documentation of sampling and custody is deficient.

Table 4: Ambient Air Results, Footnotes and Comments

EPA Comments

- A: Corresponding LBNL result was chosen by EPA for independent validation, which included review of LBNL's laboratory raw data and comparison of results against LBNL's own self-validation of the same result. No significant differences were found between EPA's and LBNL's validation conclusion for the corresponding LBNL result.
- B: LBNL chose the corresponding sample for independent analysis by LLNL using a much more sensitive method. The LBNL and LLNL results were in agreement.
- C: LBNL split the corresponding sample for independent analysis by EPA. The EPA split sample result was in agreement with the LBNL result.
- D: One batch of samples sent to EPA did not include the chain of custody. As the sample documentation for the corresponding sample did not meet the full requirements for demonstration of custody control, the sample result was rejected.